

Course Structure

Course Code : SM7104

Course Title : Energy Quality Systems

Credit Hours : 3

Course Description

Power quality systems, Voltage Sags and momentary interruptions, Electrical Transient phenomena, Fundamentals of Harmonics, Analysis of power systems harmonics.

Course Objectives

- To cover electric power quality and system harmonics. This class deals with any power quality disturbances in the supply and delivery system that prevent proper usage of user equipment.

Course Topics

- Introduction to the course and its format. Introduction to power quality systems (Santoso, chapter 1)
- Power Quality Phenomena introduction, IEC classification of power quality disturbances, short duration voltage variations (Santoso, chapter 2)
- Power Quality Phenomena long duration voltage variations, other voltage, waveform and power frequency variations (Santoso, chapter 2)
- Voltage Sags and momentary interruptions introduction and characteristics of voltage sags and interruptions and equipment sensitivity (Santoso, chapter 3)
- Voltage Sags and momentary interruptions: sources of voltage sags, utility fault and methods for reducing sags. (Santoso, chapter 3)
- Voltage Sags Analysis using Thevenin equivalent circuits and other methods. (Santoso, chapter 4)
- Voltage Sags Analysis and methods to reduce it in different motors. (Santoso, chapter 4)
- Review of Material and Midterm exam
- Electrical Transient phenomena: Introduction and sources of transient overvoltages (Santoso, chapter 5)
- Analysis of electrical Transient phenomena in capacitors and inductors (Santoso, chapter 5)
- Fundamentals of Harmonics: Loads, waveforms and introduction to harmonics (Santoso, chapter 6)
- Fundamentals of Harmonics: Power system quantities, harmonic distortion (Santoso, chapter 6)
- Analysis of power systems harmonics: principles and system responses (Santoso, chapter 7)
- Analysis of power systems harmonics: principles for controlling harmonics (Santoso, chapter 7)
- Analysis of power systems harmonics: passive filters (Santoso, chapter 7)
- Class presentations of projects and Final exam and ISO 50001 review

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References

- Surya Santoso, Fundamentals of Electric Power Quality, CreateSpace, 2010, ISBN-13: 978-1440491023